Proposed Assessment/Management Related Analysis

Initiatives for the South African Horse Mackerel

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There are two broad areas in which the need for further analyses of assessment/management related issues regarding the fishery for horse mackerel off South Africa have been identified. One concerns the purse seine fishery on the west coast, and the other the midwater trawl fishery on the south coast.

Pelagic fishery

At present the South African west coast pelagic fishery is subject to an annual limit of 5000 tons for their catches of mainly juvenile horse mackerel, given indications (e.g. BEN/DEC04/HM/SA/4a) that greater catches could have proportionally much larger negative impacts on the sustainable yields possible for the midwater trawl fishery on the south coast that targets adult fish.

This limitation is, however, potentially onerous for the pelagic fishery, and the catch limit is qualified by the statement that: "Pending further analyses, reasonable flexibility should be exercised regarding this limit during years when the high incidence of mixed-species shoals makes it very difficult for the pelagic fleet to avoid juvenile horse mackerel".

Attention needs to be given to the nature of such further analyses. There would seem to be two key issues.

a) Ideally the limit should vary with the magnitude of horse mackerel recruitment, as higher recruitment likely correlates with greater proportions of horse mackerel in mixed-species shoals with juvenile anchovy or sardine. Management procedures designed around this concept could readily be investigated, except for the existing lack of clarity on whether either fishery dependent or independent (e.g. survey) data can provide a sufficiently precise and timeous index of this recruitment.

b) The results of calculations of trade-offs between pelagic and midwater sustainable catch levels for horse mackerel (e.g. BEN/DEC04/HM/SA/4a) rest heavily on the natural mortality value assumed for horse mackerel, and in particular on an assumed limited extent to which this increases for lower ages.

What options are there for obtaining improved estimates of recruitment, and of natural mortality and its age-dependence?

Midwater fishery

The swept-area based survey estimates of horse mackerel abundance are recognized to be negatively biased, but the likely extent of this bias is not well known, nor does it seem that further survey work will resolve this issue speedily. In consequence though, it may be that the catches currently permitted in the fishery are unnecessarily restrictive.

One method to address this problem is an adaptive harvesting strategy: increase catches cautiously while monitoring indices of abundance so as to be able to reduce catches sufficiently rapidly if evidence of too great a decline in abundance becomes apparent.

This approach is readily amenable to evaluation by management procedure testing methodology, but further work towards that end would be facilitated by discussions on:

i) what measures might best be used to index future abundance trends: e.g. CPUE, surveys, catch-at-length data (Cordue, pers. commn, reports some success with use of the catch-curve slope as an index in simulation analyses for similar situations in New Zealand);

ii) what TAC algorithms offer the best prospects: e.g. population model based, or empirical approaches related (say) to the trend in an index of abundance;

iii) the extent of acceptable maximum increases or decreases in the midwater trawl allocation from year to year from industrial and allocation viewpoints.